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5 This application claims the benefit of priority under 35 USC §119(e) to provisional Patent Application No. 60/123,605, filed March 10, 1999, naming Geoffrey W. Simons as inventor.

U.S. Application No. 09/231,644, filed January 15, 1999 (Atty. Docket No. MLLTP001), commonly owned, is incorporated by reference herein for all purposes.

The present invention relates generally to computer software for filling out form documents over a computer network. More particularly, the present invention provides a method and system for sharing information among users for the purpose of automatically filling out fields in an electronic form document.

The present invention describes a process for purchasing goods and services over an electronic computer network, namely the World Wide Web, for the purpose of Gift Shopping. Gift Shopping is defined as the act of buying a good or a service (the Product) for another person. Within the scope of the electronic computer network, Gift Shopping entails that the Gift Giver release personal information pertaining to the billing of the Product, and that the Gift Recipient release personal information pertaining to the shipping, size, and type of the Product.

Thus, it is desirable to be able to share personal information with other users on a network. In such a system, a gift giver, for example, can access certain items of information, collectively referred to as a persona, which a gift

SUMMARY OF THE INVENTION

To achieve the foregoing, methods, apparatus, and computer-readable mediums are disclosed which provide an online shopper can share information
5 with intended gift receivers. The information sharing can be used on numerous non-affiliated sites. That is, the sites at which the goods are purchased do not have to be within, for example, a portal's shopping mall or any type of "walled garden." Thus, the online gift giver can access information of gift receivers from a wide variety of non-associated and non-
10 affiliated sites. While there are features similar to information sharing within restricted online shopping malls and networks of sites, information sharing outside these confines is presently unavailable.

The present invention is a technique use to gather information from different sources to be used to automatically fill in online forms. The
15 information is collected using a persona of an individual. A persona is created by filtering a larger set of raw data for that user so that only certain fields are allowed to be seen and used by others. An individual can have several personas, each assigned to a particular other individual, such as a family member or a friend. The individual allowing one of his personas to be shared
20 is the information provider and the user requesting the information is the information requester. The information is taken from both the provider and requester, and used by a vendor in a form, filled out by the information requester. In one embodiment, the information requester is a "gift giver" and the provider is a "gift receiver." The gift giver is requesting shipping and
25 other information from the gift receiver, who can grant one of his personas to the particular gift giver. The information, along with billing information from the gift giver, is used to fill out a vendor online form.

Brief Description of the Drawings

The invention will be better understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. 1A is a diagrammatical representation of a system for
5 automatically filling in electronic form documents in accordance with one embodiment of the present invention.

FIG. 1B is a block diagram showing components of a server enabling the automatic insertion of data in to an electronic form on a remote computer in accordance with one embodiment of the present invention.

10 FIG. 2 is a flow diagram of a process for automatically filling in an electronic form document in accordance with one embodiment of the present invention.

FIGS. 3A, 3B, and 3C are table diagrams showing the field names and format of registered user data in accordance with one embodiment of the
15 present invention.

FIG. 4 is a sequence diagram outlining a process of conducting purchasing gifts over a distributed network in accordance with one embodiment of the present invention.

FIG. 5 is a flowchart describing a privacy negotiation for gathering
20 information associated with purchasing gifts over a distributed network in accordance with one embodiment of the present invention.

FIG. 6 is a block diagram showing the various parties and possible message passing between the parties in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION

Reference will now be made in detail to a preferred embodiment of the invention. An example of the preferred embodiment is illustrated in the accompanying drawings. While the invention will be described in conjunction
5 with a preferred embodiment, it will be understood that it is not intended to limit the invention to one preferred embodiment. To the contrary, it is intended to cover alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

10 A method and system for automatically filling in electronic forms on a computer and not requiring a user to download or install any resident software on the computer is described in the various figures. As the presence of merchants and services increases on the Internet, electronic commerce or e-commerce will grow. More and more consumers will resort to the Internet,
15 for example, to purchase goods and services for themselves or others (e.g., gift shopping). This will typically require the consumer/user to provide at least some data, either the users own or another individuals, to the merchant typically through filling out an electronic form having various fields, most commonly names, addresses, credit card numbers, phone numbers, etc. For
20 consumers purchasing goods from numerous merchant sites and possibly using different computers (e.g. using a computer at work, using another computer at home, and yet another one while travelling), manually filling in these forms repeatedly can become tedious and inefficient. The present invention seeks to alleviate the burden of filling in electronic forms, while
25 informing the consumer/user of privacy precautions taken by a particular merchant site, and not require the user to download any resident software.

Inherent in the latter feature is allowing the consumer to use the processes of the present invention from any computer connected to the network, the Internet in particular.

The present invention uses a remote server or “privacy bank,” a novel electronic resource that responds to requests for data by preparing and transmitting a specialized document in the form of a JavaScript. This JavaScript is formed dynamically by the privacy bank upon receipt of the request for data. The JavaScript created by the privacy bank is a “profile” or mapping between field names in a particular form the user needs to fill in at a particular merchant site (*e.g.* “www.fishermanstore.com”) and standardized field names stored in the privacy bank server. Once the user’s browser program is served this profile from privacy bank, most of the fields in the fishermanstore form are automatically filled in. In the described embodiment, the user becomes a member of the privacy bank resource by providing personal information, also referred to as the raw data, to privacy bank once. This raw data can be updated from time to time by the user if desired. In addition, several filtered raw data sets or “personas” can be created for use by others who may need to access the user’s information. In another embodiment, the user can enter privacy rules or requirements once when initially becoming a member. The user does not need to download any software from privacy bank or any other resource. In the described embodiment, the merchant (*e.g.* The Fisherman Store) becomes an affiliate member of the privacy bank network by providing a sample document of its form or forms. Privacy bank can then build a mapping between fields in the merchant’s form and the standardized fields in its own database.

FIG. 1A is a block diagram of a system for automatically filling out electronic form documents in accordance with one embodiment of the present

invention. A number of end-user computers are shown on the right side of the diagram. These computers can be client computers in a network with access to the Internet or be part of an intranet. In the described embodiment an end-user computer 102 is a stand-alone computer with access to the Internet and contains an Internet browser program, a browser window for which is shown at 104. In the center of the diagram is a number of Web servers. A particular Web server 106 is a server for a merchant Web site, such as www.fishermanstore.com to which users or consumers can visit to purchase goods online over the Internet. On the left side of the diagram is a specialized electronic resource referred to in the described embodiment as a privacy bank server computer 108, also connected to the Internet.

The process of automatic electronic form completion begins with a user downloading the form from a Web site such as fishermanstore site. Returning to FIG. 1A, a user/consumer on computer 102 ("user 102") opens a browser window 104 in an Internet browser program such as Netscape Navigator or Internet Explorer, depicted by arrow 110. User 102 then goes to www.fishermanstore.com shown by arrow 112 via the browser and decides to purchase goods. User 102 then downloads from the Web site contained on Web server 106 an electronic purchasing form that needs to be completed as depicted by arrow 114. A purchasing form 116, typically an HTML document, is returned and downloaded into and displayed in browser window 104. At this juncture, user 102 would normally have to "manually" fill in each field in purchasing form 116. Much of this information is typically standard: name, address, phone number, payment method, user email address, etc. In accordance with one embodiment of the present invention, user 102 can "click" on a privacy bank icon or button in form 116 and have the form automatically filled in.

As stated earlier, it is assumed in this discussion that www.fishermanstore.com is registered with and thus an affiliate member of the privacy bank service assessable from privacy bank server 108. Being an affiliate member of the privacy bank service, purchasing form 116 contains a privacy bank icon or button 118. By clicking on privacy bank icon 118, user 102 essentially completes a process for automatically filling in form 116 by transparently transmitting a completed form to the privacy bank service on server 108, depicted by an arrow 120. The information needed for filling in the form is transmitted to user 102 once form 116 (an HTML document) is parsed, which occurs when form 116 is downloaded. This process is described in greater detail in FIG. 4. User 102 informs privacy bank server 108 of the identity of the user and of which Web site and which form on that Web site (if more than one) the user wishes to have filled in. This information is transmitted to privacy bank server 108, unbeknownst to user 102, when form 116 is downloaded. Techniques for accomplishing this are described below. Once privacy bank server 108 receives a request from registered user 102 (by virtue of an external link in form 116 executed when the form is parsed by user 102), it begins preparing information needed to fill in form 116 on user computer 102. In the described embodiment, the information sent to user computer 102 is a JavaScript program 124 referred to as a "profile." Explained briefly, this profile contains a mapping of privacy bank standardized fields and fields in purchasing form 116 and "raw," generally personal, data associated with user 102. The content of this profile and JavaScript program in general is described in greater detail in FIGS 7A and 7B below. Once received by the browser program on user computer 102, the filled out purchasing form 116 is displayed to user 102 as depicted by arrow 126. This occurs when user 102 presses or clicks on privacy bank icon 118.

The information needed to complete form 116 is already resident in the browser program. At this juncture, user 102 can decide whether to proceed with submitting the form (typically after filling out a few more fields such as which items to purchase, quantity, etc.) or declining to submit the form, perhaps after reviewing the fishermanstore's Web site privacy safeguards or for any other reason.

FIG. 1B is a block diagram showing components of a privacy bank server enabling the automatic filling in of electronic forms on a remote user computer. A privacy bank server, such as server 108 in FIG. 1A, contains several functional and storage components needed for compiling the data needed for filing in a form, such as form 116. Shown in FIG. 1B are four major components of a privacy bank server in the described embodiment. These components and storage areas include a raw data profile storage area 128, a form mapping storage area 130, a negotiation history module 132, and a shippable code constructor 134. Raw data profile storage area 128 contains sets of data relating to registered users of the privacy bank service, one set or profile shown in area 136. A registered user has a unique account number that can be used as an identifier and a password, shown in an area 138. The standard field names set by the privacy bank service, discussed in greater detail in FIGS. 8A, 8B, and 8C, are paired with a user entered data string (such as first name or home street address), followed by a use-preference condition. This data is contained in an area 140. Another profile for another registered user is shown in an area 142. Each registered user has a similar raw data profile.

Form mapping area 130 includes multiple form mappings, an example of which is shown in an area 144. Each electronic form that is registered with the privacy bank service by an online merchant or seller (*i.e.* an affiliate

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If the privacy bank server determines that the user computer or browser does not have a valid cookie, it implies that the user has not yet logged into the privacy bank service. If so, control goes to step 212 where the

privacy bank server retrieves a login sequence code. This code will trigger a login sequence and enable the user to log in to or register with the privacy bank service at a later step in the process, as described in greater detail below. At step 214, the privacy bank server forms a completed package of shippable code containing the retrieved login sequence code, such that the login
5 sequence will be triggered at a later step in the process. At step 222, the browser retrieves this completed package of shippable code from the privacy bank server. The shippable code is then stored in the browser residing on the user's computer, and is executable upon a user trigger, which is described in
10 greater detail below.

If the privacy bank server determines that the user/browser making contact by downloading the electronic form and executing the external link has a valid cookie, control goes to step 216 where the privacy bank server gets and reads the user's cookie. In this context, having a valid cookie indicates
15 that the user has already gone through the login sequence recently, for example during the existing Internet session, and thus it is not necessary for the user to go through the login sequence again. By reading the user's cookie, the privacy bank server can determine who the user is and thus can retrieve the user's raw data stored by privacy bank. The contents and format of this raw
20 personal data is described in greater detail in FIGS. 8A, 8B, and 8C below. At step 218, the privacy bank server retrieves the user data for the user identified by the valid cookie. The privacy bank server couples this user data and an identifier, such as a URL (uniform resource locator), to determine how the electronic form document should be filled. At step 220, the privacy bank
25 server forms a completed package of shippable code (item 124 in FIG. 1A) containing the user data that will be used to fill out the form document. In the described embodiment, this shippable code, referred to as a profile, is in the

user/browser thereby enabling it to recognize the user and messages from the user's browser in subsequent transactions. At step 230, the privacy bank server retrieves the user data for the identified user, couples this user data and an identifier, such as a URL (uniform resource locator), to determine how the electronic form document should be filled, and forms a completed package of shippable code containing the user data that will be used to fill out the form document. This step is substantially similar to steps 218 and 220, as described above. At step 228, the browser receives the shippable code, or profile, from the privacy bank server, and now has access to it on the user computer. This shippable code now contains user data that allows the form document to be filled out automatically. At this stage, control proceeds to step 234, where the browser utilizes the shippable code and user data to fill out the electronic form document. Further input from the user, such as re-clicking on the "autofill" button, is not required. In other words, once the user properly completes the login sequence, the form is then filled out automatically, and it is not necessary for the user to click on the "autofill" button again.

At step 236, the user visually examines the filled out form and the privacy features offered by the Web site and decides whether the form is acceptable. If the user finds that the form needs further adjustment, the user adjusts the document at step 238. This may be done manually, or through any supplemental automated process, such as a client-based macro. This can involve filling in fields that could not be filled in by the profile sent by the privacy bank server (in other words, fields that could not be filled out from the raw data). Such fields can include, for example, which items being purchased and the quantity of items. It can also include updated personal information such as a new address or credit card number. In this case, the user simply types over the information already in the fields. Control then returns to step

236, which is satisfied presumably after going through step 238 once. At step 240 the browser submits the filled out electronic form eventually sending it to the merchant's Web server once the user clicks on a Submit form button in the browser window.. In the described embodiment, the filled out form is first
5 sent to the privacy bank server unbeknownst to the user or at least transparent to the user. The completed form is received and examined by the privacy bank server which updates its raw data repository to reflect any changes the user may have made to his or her personal information. The privacy bank server then posts a message back to the user computer (according to HTTP
10 protocol the server must send a message back to the user computer when it receives an HTML document from it). In the described embodiment, the message it sends back or posts to the user's browser is similar to a "Click Here To Continue" type screen to the user. Hidden behind this message is the completed form that was sent to the privacy bank server. Presumably, the user
15 will click to continue and by doing so transmits the hidden completed form to the merchant's Web server. In other preferred embodiments, the completed form is sent to both the privacy bank server and the merchant's Web server at the same time. In yet another preferred embodiment, the completed form is posted automatically from the privacy bank server directly to the merchant's
20 site without any additional input from the user. At this stage the automatic form filling process is complete.

FIGS. 3A, 3B, and 3C are high-level table diagrams showing how fields containing the raw data and preferences for a user are organized on the privacy bank server in accordance with one embodiment of the present
25 invention. A top-level User table 302 has four columns: User 304, Category 306, Type 308, and Short display name 310. User Table 302 has four areas of data under column User 304 represented by four rows: Home 312, Work 314,

Billing 316, and Shipping 318. In the described embodiment, the user is presented with these four areas of data when registering with the privacy bank service and enters information by going through each of these data areas.

5 Skipping Category 306 for the moment, column Type 308 takes the raw data tree down one level from the top level represented by table 302. For example, the Type for data area Home 312 is Info. This performs as a pointer or link to an Info table 320. The first column 322 of table 320 is labeled Info but the other three columns are the same as shown in table 302; that is, Category 306, Type 308, and Short display name 310.

10 At table 320, the user begins entering data that will be used for her home information and for Shipping since data area 318 for Shipping in table 302 also has an Info in its Type column 308. A Name row 322 has in its Type column 308 a reference to yet another table PersonName, shown as table 324. Similar to table 302 and 320, PersonName table 324 has a first column labeled
15 PersonName and the same three columns as the other tables. All five data areas in PersonName table 324: Prefix, First, Middle, Last, and Suffix have as a Type a primitive type referred to as Text in the described embodiment. Text represents a data string that is the actual data item stored in the privacy bank server. By examining the Type column 308 of each of the data areas, a user
20 enters all the raw personal data. An actual data item is entered at each Type box containing Text, indicating a primitive type, or a leaf node when viewed as a tree structure. If the Type column does not contain "Text," another table exists that refines the data area further.

To follow another example, under the data area Billing 316 shown in
25 table 302, its Type 308 indicates BillInfo and not Text. A table BillInfo has six further data areas, none of which have a Text Type, so no actual data values can be found at this level. Taking the CreditCard data area as an

example, its Type indicates “CreditCard.” Table CreditCard, shown in FIG. 3C, has four data areas: Type, Number, ExpMonth, and ExpYear, all of which are of Type Text, which contain actual data values.

Short display name column 310 contains a string that is displayed to the user through a user registration graphical user interface of the described embodiment. The user follows the data tree via a user interface using the Short display name strings as field names or guides to entering the data. The data areas that have primitive Types, which in the described embodiment is Text, are the privacy bank field names that are mapped with the legacy field names in the electronic forms registered with the service. In the described embodiment, the privacy bank names include (in abbreviated form):

15	PersonName.Prefix PersonName.First PersonName.Last PersonName.Suffix	Address.Street1 Address.Street2 Address.City Address.StateProv Address.PostalCode Address.Country	PhoneNum.AreaCode PhoneNum.Number PhoneNum.Extension
20	Internet.Email Internet.HomePage CreditCard.Type CreditCard.Number	Employment.Employer Employment.Department Employment.JobTitle	
25	CreditCard.ExpMonth CreditCard.ExpYear		

Category column 306 is related to privacy settings set by the user and are tied to the preferences set by a user and defined in terms of the conditions as described above. The conditions or use thresholds in the described embodiment are marketing (targeted), system administration, personalization, research and development, and completion of activity (*i.e.* ordering). The Categories available in the described embodiment and as shown in the tables of FIGS. 3A, 3B, and 3C, are Physical Contact Information, Online Contact Information, Demographic Data, and Financial Data. The relationship

between the Categories and the conditions of the described embodiment can be described as a table five-row, four-column table (a 20 cell table) where each condition is one row in the table and each Category is one column in the table.

- 5 The present invention is an extension to a Form AutoFill Server using Personal Information sharing between Individuals to fill in electronic forms that are a part of the Form AutoFill and/or Gift Shopping service (the Service). The Form AutoFill Server is used to dispatch JavaScript code to the Web Browser, which enables the form to be filled. The Form AutoFill Server
- 10 is a use of a Light Code Server, which serves Shippable Code Segments that are executed on the Web Browser's machine. By allowing Individuals to share their information with other Individuals, the Form AutoFill Server can provide data elements from two or more Individuals during a Privacy Negotiation (see *Privacy Negotiation*).
- 15 The essence of Gift Shopping is that more than one Persona is used to fill a form. A Persona is defined as a data repository containing an Individual's personal information along with the privacy preferences that indicate how the Individual wants his or her data treated. Users of the Service may have multiple Personae as well as permission to use parts of other
- 20 Individuals' Personae. There are two kinds of Gift Shopping that need to be covered. The first is Gift Shopping for people who are not necessarily subscribers/members of the Service. The second is Gift Shopping for people who are subscribers/members of the Service. In the latter case, we have to cover the mechanism for releasing permission to use a Persona of an
- 25 Individual by another Individual for Gift Shopping purposes.

FIG. 4 is a flow diagram of a process of an Individual (Gift Giver), who is Gift Shopping online and purchases a product from a Product Vendor

that subscribes to the privacy bank service. They would like to buy a Product 401 that the Vendor is offering through an online form. The Gift Giver commands the browser to request a form from the Vendor 402. The Vendor returns the document to the browser 403, which in turn displays the form to the Gift Giver 404. The Gift Giver clicks the 'Gift Shop' button 405, which is embedded in the HTML form at the Vendor's web site. The 'Gift Shop' button is the trigger that requests the Gift Recipient Selection form from the Service 406. Since the intended Recipient is not a member of the Service, the Gift Giver may elect to create a new Persona or use a Persona that they have created in the past for Gift Shopping 409. The Gift Giver must fill in shipping information and any information related to the Product for a new Persona. During the selection of the Gift Recipient, a session parameter is set to identify which Persona to use for a Gift Recipient 410 when the Privacy Negotiation is to be conducted. After completing the Recipient creation, the browser is sent a document 411 that automatically requests the HTML form from the Vendor 412. The HTML form is returned to the browser 413, which again displays the form to the Gift Giver 414. Each time the form is loaded, it makes a request to the Form AutoFill Server, which conducts a Privacy Negotiation (see *Privacy Negotiation*) between electronic agents representing the Vendor, the Gift Giver, and the Gift Recipient if the Gift Giver is logged into the Service. JavaScript code is returned to the browser and executed there 415, filling the form with the results from the Privacy Negotiation. The Gift Giver then submits the form by clicking a 'Submit' button 416, which commands the browser to post the submission to the Service 417. After processing the submission, the browser receives a document 418, which commands the browser to submit the information to the Vendor's Web Server 419.

A Gift Giver, who is Gift Shopping online, visits a Product Vendor that subscribes to the Service. The Gift Giver would like to buy a Product the Vendor is offering 401. The browser requests an HTML form from the Vendor 402. The HTML form is returned to the browser 403, which is then displayed to the Gift Giver 404. The Gift Giver clicks the ‘Gift Shop’ button 405, which makes the request for the Gift Recipient Selection form from the Service 406. The ‘Gift Shop’ button is embedded in the HTML form at the Vendor’s web site. The Gift Recipient Selection Page is returned to browser 407, which is displayed to the Gift Giver 408. The Gift Giver may select a Recipient’s Persona 409 that has been made accessible to the Gift Giver by the Gift Recipient (see *Sharing Personae*). The browser posts the Gift Recipient Selection to the Service 410. The browser is sent a document 411 that automatically requests the HTML form from the Vendor 412. The HTML form is returned to the browser 413, which again displays the form to the Gift Giver 414. Each time the form is loaded, it makes a request to the Service, which conducts a Privacy Negotiation (see *Privacy Negotiation*) between electronic agents representing the Vendor, the Gift Giver, and the Gift Recipient if the Gift Giver is logged into the Service. JavaScript code is returned to the browser and executed there 415, filling the form with the results from the Privacy Negotiation. The Gift Giver then submits the form by clicking a ‘Submit’ button 416, which commands the browser to post the submission to the Service 417. After processing the submission, the browser receives a document 418, which commands the browser to submit the information to the Vendor’s Web Server 419.

25 A Privacy Negotiation is the process of determining if a Vendor's stated Privacy Practices meet the requirements of an Individual's Privacy Preferences. A standard Privacy Negotiation is conducted between a single

FIG. 5 is a flow diagram of a Privacy Negotiation that begins by requesting if the Information Buyer 501, which is an agent for the Vendor in the current model, has any more BIDs. If Yes, the Privacy Negotiation records the BID in its transaction history and forwards it to the Information Seller 502, which is a Message Router in the case of Gift Shopping. The Message Router receives the BID 503, and determines if it is intended for the Gift Giver's Information Seller or the Gift Recipient's Information Seller based on the mappings that define Gift Shopping 504. In the instance there is no gift shopping, control from 503 goes straight to 508 where it is determined if the BID meets certain privacy preferences of the information seller. Returning to step 504, if the BID is intended for the Gift Giver's Information Seller, it receives the BID 505. If the BID is intended for the Gift Recipient's Information Seller, it receives the BID 506. The BID is considered by the Information Seller that receives it 507. The Information Seller determines if

acts accordingly by either shipping out the goods or sending a message to the gift giver that the BIDS shipping information request was denied.

Although the foregoing invention has been described in some detail for purposes of clarity of understanding, it will be apparent that certain changes and modifications may be practiced within the scope of the appended claims. Furthermore, it should be noted that there are alternative ways of implementing both the process and apparatus of the present invention. Accordingly, the present embodiments are to be considered as illustrative and not restrictive, and the invention is not to be limited to the details given herein, but may be modified within the scope and equivalents of the appended claims.

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